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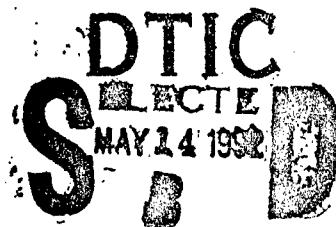
NAVAL WAR COLLEGE
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BUGS, GAS, AND JOINT MARITIME OPERATIONS-- ARE WE IMMUNE?

by

Russell A. Bucy

Major, U.S. Army



A paper submitted to the Faculty of the Naval War College in satisfaction of the requirements of the Department of Operations.

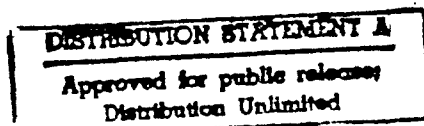
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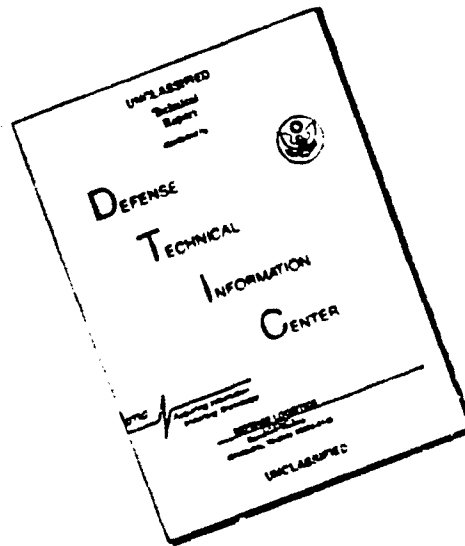
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Abstract of
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Historical and technological data are used to analyze the effects of chemical warfare on joint naval operations throughout the continuum of peace, conflict, and war. A judgement is made that the evolution of our National Military Strategy from a global to regional focus, combined with the proliferation of chemical and biological (CB) weapons among regional powers will pose an increased risk to naval forces. Chemical employment philosophy is presented to show the effect of (CB) warfare on a wide range of naval missions, including presence, coalitions, and operational strategy. The conclusion is made that blue water forces in the brown water role are not immune, and must retain the initiative by training for chemical environments in regional contingencies.

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BUGS, GAS, AND JOINT MARITIME OPERATIONS-- ARE WE IMMUNE?

CHAPTER I

INTRODUCTION

We've got a lot of questions about why the Iraqis didn't use chemical weapons, and I don't know the answer. I just thank God they didn't.

General Norman Schwarzkopf

The Problem

The unique role of joint maritime forces does not necessarily make them immune from chemical and biological (CB) warfare. Employment of weapons of mass destruction will pose many problems for maritime commanders and staffs when accomplishing missions during regional contingencies. Even with the fall of Soviet communism, many parts of the world remain a quagmire of unpredictable governments, socio-political change, and unchecked spread of high technology weapon systems. For the 1990s, our National Military Strategy requires us to demonstrate new flexibility and resourcefulness. Having the time to train and equip to meet the challenges will be a luxury of the past. One solution to the problem of Chemical warfare is to increase our awareness and fully integrate CB defense programs into our joint maritime strategy.

We may never know why the Iraqis didn't use chemical weapons during Desert Storm. General Schwarzkopf speculated the destruction of Iraqi delivery capability, damage to CB production sites, or Iraqi concerns about the possibility of

nuclear retaliation might be a few reasons.¹ Why the Iraqis didn't use chemical weapons is a moot question. The fact remains that a number of other nations have the capability to challenge regional stability by using weapons of mass destruction.

New Strategy for a Changing World

The break up of the Soviet Union has resulted in our military strategy shifting from a global to a more regional focus.² President Bush has said "A new world order is not a fact: it is an aspiration - and an opportunity."³ Even with the collapse of Soviet communism, there are powers who would challenge our aspirations:

...a technological revolution promised to accord smaller nations the ability to contest militarily and economically (at least locally) with world powers... Revitalized ethnic and religious forces began challenging traditional power elites, if not the very existence of a variety of states...⁴

As our military focus evolves, joint maritime forces will be called upon to accomplish more "brown water" operations in coastal areas with forces primarily designed to accomplish deep ocean "blue water" operations. These operations will span the operational continuum of states from peace to conflict and finally, war.

Chemicals in the Technological Revolution

Weapons of mass destruction offer regional powers an opportunity to be on a par with the community of nations which

seek to promote greater world stability. Despite attempts by many nations to limit their spread, chemical and biological (CB) weapons continue to offer the attraction of economy of force and psychological terror. Chemicals and bacteriologicals are easy to produce, acquire, and conceal. When compared with sophisticated conventional weapons, they are relatively inexpensive, and can produce significant degradation to the operational tempo by requiring the use of cumbersome protective equipment. Finally, their use on unprotected troops or civilians produces terrifying results.

An estimated thirty nations are known or suspected of possessing chemical weapons, or have the ability to manufacture them. Among these countries are the Commonwealth of Independent States (formerly the Soviet Union), the United States, France, Egypt, Syria, Libya, Israel, Ethiopia, Burma, Thailand, China, North Korea and Taiwan. South Korea and Iran have sought to possess chemical weapons.³ Although Iraq's chemical weapon stockpile may have been eliminated during Desert Storm, it may be difficult to completely eradicate Iraqi CB capabilities. One thing is clear: The proliferation of chemicals and bacteriological weapons among regional powers is a reality.

New Wrinkles for U.S. Interests

Many nations possessing or seeking to possess chemical weapons have contiguous waters, or are located in geographi-

cal areas of interest to the United States. A few of these nations have the capability of projecting limited naval power into sea lines of communication. How will these powers use chemical or bacteriological weapons to further their interests? What capabilities do they have? How will chemical weapons affect our ability to project power? Strategic and operational planning must address these questions with the unique role and strategic importance of joint maritime forces firmly in mind.

The chemical "invulnerability" of blue water naval forces may become a myth as they are employed in operations closer to shore, in amphibious task forces (ATF), or in peacetime presence operations. Amphibious operations will reduce mobility and increase the risk of attack by presenting lucrative chemical and biological targets to would be enemies.

CHAPTER II

ARE MARITIME OPERATIONS AT RISK?

Unique Challenges of Maritime Operations

The Navy and Marine Corps play critical roles in our new National Military Strategy. If we accept an increasing "brown water" role, we cannot afford the idea that naval operations are immune from any enemy capability. Proliferation of high tech weapons requires us to make the assumption that future enemies will have the capability to attack us with chemicals until it can be proven otherwise. To remain flexible, operational commanders must retain the initiative and stand ready to meet any threat, including the use of weapons of mass destruction.

Chemical or biological attacks on seaborne forces present a different set of problems than attacks on land forces. We might argue that "blue water" naval vessels are immune from chemical attack by virtue of rapid mobility, technological advances in defensive weaponry, and the distances they operate from shore. Even so, the Falklands/Malvinas conflict and the Iran-Iraq tanker wars proved it was technologically possible to hit a moving ship with a small air delivered conventional munition. Therefore we must accept the logic that a ship can be hit with a chemical weapon as well.

Chemical weapons will never replace the use of conventional weapons at sea. There is no argument that "steel on target" is the best way to sink a ship. However, it is also true that saving a ship disabled by conventional munitions will be greatly hampered if chemicals are simultaneously or sequentially interposed on the conventional weapon. It's possible to create the same effect by attacking ships indirectly with an agent cloud dispersed in their path or from above. This technique will be discussed later.

From the enemy perspective, chemical/biological weapons may be extremely useful. An enemy may use or threaten to use chemical weapons for a variety of reasons: To offset U.S. technical superiority, for some political purpose, or simply to place increased apprehension into the minds of our soldiers, sailors, and marines.

Regional peacetime presence may invite the use of chemical weapons through terrorism or direct attack. Naval forces may be asked to perform a variety of peace keeping and disaster relief efforts in the wake of limited chemical warfare by terrorists or belligerents.¹ An area of concern is the execution of non-combatant evacuation operations (NEO) for American citizens or others requesting U.S. assistance abroad. Finally, the chemical capabilities of potential enemies may require operational commanders to demonstrate CB defense proficiency in exercises or shows of force to convince potential enemies of the futility of using chemical weapons.

Theoretical Effects on Ships at Sea

A ship is a sophisticated tool. A chemical attack might result in enough damage to the crew of a ship or a portion of a task force to make routine operations extremely hazardous. A contaminated ship cannot outrun itself. Modern washdown systems are very effective if available and operational after conventional attacks. By themselves, washdown systems are not enough. Chemical agent monitoring equipment must be used to determine the effectiveness of these systems by confirming or denying the presence of agent after decontamination. Agent monitors are inevitably operated by sailors or marines who must "undo the hatch" and go outside to operate.

Ground forces have the advantage of mobility out of contaminated areas and multiple logistic paths of re-supply after chemical attack. In contrast, most naval units operate with just enough chemical equipment to handle the immediate emergency. Ships carry the contamination with them if they cannot decontaminate. Each ship in a naval task force provides a unique and vital function within the mission objectives of the force. Even a temporary loss of a ship from an attack may be detrimental to the entire task force mission.

Ships are typically placed in harms' way during shows of force or demonstrations of U.S. presence. Unlike the ground component, these ships may have no alternatives and no where to go if they become contaminated. Replacements of contaminated casualties or equipment may be more difficult than it

would be for the ground component, and the naval force may not be in a geographical location to receive replacements if they are available. A ship may have to slow it's operational tempo or cease operations altogether until decontamination is completed.

The threat to naval forces has been recognized for many years, but the application of solutions has not always been practiced. In 1934 the Chief of Naval Operations (CNO) forwarded a memorandum on chemical warfare from the Director of Fleet Training to all Navy operational commands, Bureaus, and the Naval War College. The memorandum points out several aspects of chemical warfare at sea. In 1934 the technology was not available to generate large volumes of gas over naval ships at sea, but ships were still viewed as vulnerable to attack:

Such lethal concentrations might, however, be effected by explosive projectiles or bombs, and individual protection by gas masks must be relied upon. The generally accepted opinion at present is that high explosives offer a better result than chemicals for destructive effect. In certain phases of offensive action (such as landings and combined operations) this does not apply...In port or at anchor ships are more or less subject to the same hazards as armed forces ashore and protective and defensive screening against the use of chemicals is a province of tactical arrangements and training.²

By World War Two, improved chemicals and delivery systems had altered the chemical warfare landscape. Lewisite and Mustard (blister agents) had been the chemicals of choice during the interwar years. With the development of nerve agents and ballistic missiles, the potential lethality of

chemical warfare changed. The odorless and colorless nerve agents could kill unprotected persons within minutes of exposure, and delivery systems added increased surprise to chemical attacks.

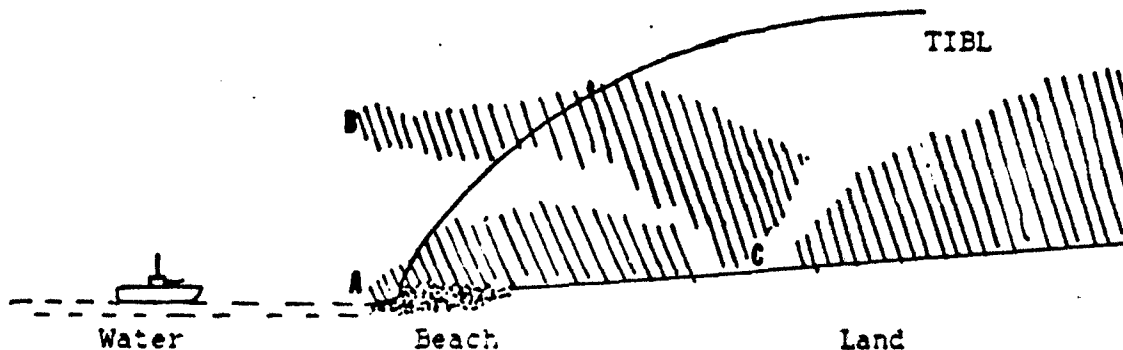
In his 1934 memo, the Director of Navy Training proposed the Navy investigate other weapons to enhance the effectiveness of conventional munitions:

The addition of a small amount of CN in our high explosives would not seriously reduce their destructive effect to material and would mean that the compartment in which the shell exploded, together with adjacent compartments punctured by fragments, would be filled with tear gas, forcing the damage control parties to wear goggles, and (for safety) masks, in view of the probability of lethal, or other irritating, gases being present. This would reduce the efficiency of damage control parties to a marked degree and might also result in temporary casualties to men at reserve stations. The delay in nullifying material damage might well decide a battle.³

The employment of such weapons may not even be necessary. Chemicals might be employed from shore or by aircraft by using a common weather phenomenon known as the Thermal Internal Boundary Layer (TIBL) shown in figure 1. It would not be necessary for the delivery vehicle to approach or overfly the naval force. There is historical evidence to support the effectiveness of chemical weapons on naval operations.

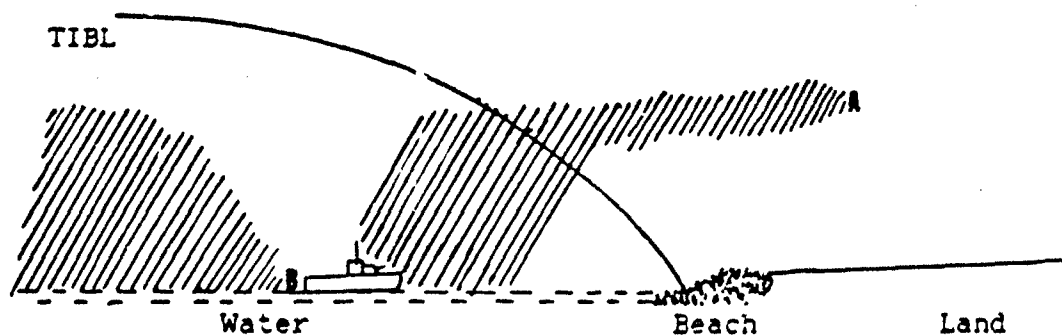
FIGURE I

THERMAL INTERNAL BOUNDARY LAYER (TIBL) IN CHEMICAL ATTACKS



Example #1 Onshore Flow.

Illustrates CB agent released at point A disrupting operations within 1 km of the beach. Agent released at point B may disrupt aircraft as far as point C. Inland of point C the agent may become "trapped" in an airborne state.



Example #2 Overwater Case.

Illustrates CB agent released at point A fumigating downward in high concentrations on limited areas. Agent released at point B may become trapped airborne in the offshore TIBL.

Source: Meteorological Analysis of CB Agent Dispersal in an Amphibious Environment-- An Operational Perspective. Recon Technology, 15 April 1986 p. 6.

History- Theory in Practice

American ground forces have not been attacked by lethal chemical weapons since 1918. We cannot say the same for our Naval forces. The United States deployed thousands of tons of chemical agent to overseas and held them for immediate retaliation should the Germans or Japanese conduct chemical strikes during WWII. In July 1943, allied agents reported a quarter of a million tons of German nerve agents were stored east of the Rhine. In September 1943, stockpiles of axis chemical weapons were captured on Sicily. In response, the U.S. positioned chemical weapons in Italy to provide immediate retaliation in kind if necessary.*

The Chemical Air Depot of General Jimmy Doolittle's 15th Army Air Force (AAF) was to receive 2,000 M47A1 mustard gas bombs. The Italian port of Bari on the Adriatic coast was selected as the port of debarkation for these bombs. As the primary port for the Italian campaign, Bari was strategically significant. The 15th AAF and Field Marshall Bernard Montgomery's 8th Army received their supplies through Bari. The 8th Army was relieving German pressure on General Mark Clark's 5th U.S. Army at Salerno. The Germans also realized the strategic significance of Bari. Field Marshall Kesselring, commander of axis forces in Italy, ordered the harbor bombed. On December 2, 1943, 105 Junkers JU88 bombers of Frieher von Richtofen's Luftflotte 3 conducted the raid which would be referred to as America's Second Pearl Harbor.*

Seventeen ships were sunk in the attack and eight ships were damaged, but the most devastating damage came when the 10,000 ton Liberty ship *S.S. John Harvey* disintegrated in a tremendous explosion. The *John Harvey* had been carrying the 15th AAFs 2,000 mustard gas bombs. Some of the mustard was vaporized in the explosion and carried by the wind over the town of Bari. Liquid mustard mixed with bunker oil floating on the water. Hundreds of survivors were floundering in the water, oil, and mustard gas mixture and breathing the vapor. Rescue boat personnel constantly dipped hands and arms into the water during the rescue effort. Despite the tell-tale odor of garlic (well known to be associated with mustard gas), only one of the crews on the thirty odd ships in the harbor donned protective masks, but these were removed when other crews were observed not wearing protective equipment. Disbelief proved fatal for many.

The destroyer *USS Bistera* picked up 30 survivors, and was ordered to Taranto harbor, 250 miles away. When *Bistera* reached Taranto the next day "...her officers and crew were almost all totally blind and many were badly burned. It was almost eighteen hours before they eventually landed in Taranto harbor."⁶ The crew of *Bistera* had unwittingly become the first warship victims of an easily identifiable chemical agent during a declared war. The death toll at Bari eventually reached 678 sailors and over 1,000 civilians, most from mustard agent injuries.

Besides the loss of life, the 8th Army's supply line was restricted, the 15th AAF's bombs, fuel, and repair parts were destroyed, and ships and supplies for the Anzio operation were either at the bottom of Bari harbor or contaminated. - One of the most critical aspects of the chemical disaster was the disabling of the 15th AAF, which was supposed to bomb aircraft industry targets deep in Germany, thus allowing the allies to attain air superiority in Normandy by May of 1944.⁷ The slowing of the bombing effort forced General Eisenhower to put off the Normandy landings from May to early June 1944, lengthening the war in Europe by several weeks. The operational impact on the *Bistara* and other ship's crews in the harbor cannot be overlooked. Could the Bari disaster be repeated today?

CHAPTER III

OPERATIONAL SCENARIOS

The Pre-Emptive Strike

Speaking at an American Defense Preparedness symposium in April 1986 in San Diego, Admiral Isaac Kidd¹ proposed a scenario similar to this:

Surfacing undetected at night off a U.S. Naval base, three submarines quickly run lines and install pump mechanisms for aerosol generators mounted just aft of their sails. Within moments, the aerosol generators begin spewing thirty gallons of nerve agent a minute into the atmosphere. Four hundred gallon tanks below deck are emptied in just over twelve minutes. The timing of the attack has been optimally selected by meteorologists to take advantage of the TIBL (figure 1) which carries most of the 1200 gallons of aerosolized nerve agent onto the naval base.

Within an hour, personnel ashore begin to experience the effects of the odorless and colorless aerosol and are rendered unconscious. The aerosol creeps slowly over the base, choking and immobilizing anyone outdoors. Sleeping personnel silently succumb to the effects of the vapor. Before closing the hatches, the submarine crews disconnect the agent tanks, roll the transfer hose from the tank end to the pump outside

the submarine, and dump the pumps, hoses and aerosol generators at sea. The entire attack has been accomplished in 15 minutes.

The next morning, survivors of the attack have their hands full caring for the wounded and accomplishing their emergency action tasks. Contamination of tons of equipment and supplies is suspected. It will be several weeks before the base is back to full operating capacity. Until proven otherwise, ships or aircraft using the base risk the chance of contamination until it is declared safe for operations. The Maritime pre-positioning ships (MPS) located at the installation are the first priority for agent monitoring and if necessary, decontamination.

In the meantime, the foreign power instigating the attack is already moving ground forces into a neighbor country, knowing that a key American regional installation has been crippled by chemical terrorism and will require rehabilitation for days, maybe weeks.

This scenario was first developed with the Soviets as instigators, but any nation with the submarines, chemicals and ingenuity might accomplish similar attacks. Variations of this type of scenario have been played out as precursor attacks on U.S. installations in a variety of wargames.²

Joint force commanders and staffs cannot afford the luxury of determining enemy intentions. Contrarily, we must examine enemy capabilities and the effects of his actions on

our operations. Awareness, preparation, and conditioning are one solution to cope with a wide range of potential enemy actions. At Ypres in 1915, the unprepared French and British lost 5,000 dead and 10,000 wounded in just a few hours during a German chlorine attack.³ Behind the cloud of chlorine came German troops wearing special respirators and trained to operate in a chemical environment. Not anticipating such dramatic success, the Germans had not planned decisively and did not commit enough troops to consolidate their gains. If they had, the outcome of the First World War might have been different. Once the "genie of chemical warfare"⁴ had been released, all the major combatants began to plan for its use and take the necessary defensive measures which would limit its effectiveness. Training and understanding of the enemy capabilities minimized the threat. Even so, there were over a million gas casualties during WWI.

In peacetime, commanders and troops think about the threat of chemical warfare, and some even train in protective postures to pass readiness tests. However, it is human nature to disregard a threat that is not immediately visible, or seems impractical. Psychologically it's more comforting to believe the enemy will fight the same way we would. However, it may be difficult to predict how an enemy might react if he has his back to the wall by technologically superior forces. He may resort to an illogical act using weapons of mass destruction. In a regional conflict, our maritime oper-

ations may be the only target he can find to strike.

Wartime realities rapidly change our attitudes; One of the foremost thoughts in the minds of soldiers, sailors and marines deploying to the Persian Gulf during Operation Desert Shield was not whether Saddam Hussein intended to use chemical or biological weapons, but when and where he would use them. This reality caused many service men and women to re-evaluate the effectiveness of their chemical, biological, and radiological (CBR) readiness. Suddenly the protective mask and a chemical specialist became everyones best friend.

Nervous Central Command (CENTCOM) forces began to conduct refresher training in chemical defense and other skills prior to deployment. Headquarters NAVCENT in Honolulu requested chemical defense training and equipment from U.S. CINCPAC components. Two U.S. Army chemical personnel eventually accompanied NAVCENT forces to the Persian Gulf to assist with the NAVCENT HQs training program. The reality of chemical warfare is evident in President Bush's January 5, 1991 message to Saddam Hussein:

Let me state too, that the United States will not tolerate the use of chemical or biological weapons or the destruction of Kuwait's oil fields and installations. Further, you will be held directly responsible for any terrorist actions against any member of the coalition. The American people would demand the strongest possible response. You and your country will pay a terrible price if you order unconscionable acts of this sort.⁵

Regardless of our stated policy, we were not able to deter Saddam from destroying Kuwaiti oil wells. What

would we have done if he had used chemical or biological weapons? Winston Churchill knew what he would do during WWII. In a July 6, 1944 memorandum to his service chiefs, Churchill expressed his thoughts on the effectiveness of enemy chemical attacks on the Normandy beachhead:

I want a cold-blooded calculation made as to how it would pay us to use poison gas, by which I mean principally mustard. We will want to gain more ground in Normandy so as not to be cooped up in a small area. We could probably deliver twenty tons to their one and for the sake of their one they would bring their bomber aircraft into the area against our superiority, thus paying a heavy toll.

Why have the Germans not used it? Not certainly out of moral scruples or affection for us. They have not used it because it does not pay them. The greatest temptation ever offered to them was the beaches of Normandy. This they could have drenched with gas greatly to the hindrance of our troops. That they thought about it is certain and that they prepared against our use is also certain, but the only reason they have not used it against us is that they fear the retaliation. What to their detriment is to our advantage.* (Emphasis added)

Clearly, chemicals are messy- both in human and environmental terms. On land, contamination and collateral damage are difficult to control, unprotected civilians can easily become unwitting targets, and contamination may last well beyond the timeframe required. The effect of world opinion, the 1925 Geneva protocol limiting chemical weapons use, and other agreements have not kept nations with chemical weapons from using them. These agreements are specifically designed to limit the frightfulness of war gas. An illustrative example of the use of mustard gas can be found at figure 2.

FIGURE 2

PURPORTED USES OF MUSTARD GAS SINCE WWI

PERIOD	USER	OPPONENT	PLACE USED
1920-25	U.K.	Rebels	Middle East
1925	France	Morocco	Fez
1930s	USSR	Basmatch tribes	Central Asia
1935-36	Italy	Abyssinia	Abyssinia
1937	Japan	China	Yangtze Front
1939	Germany	Poland	Warsaw
1939	Poland	Germany	Jaslo
1963-67	Egypt	Yemen	Yemen
1976-79	Vietnam	H'mong tribes	Laos
1979-80	Vietnam	Kampuchea	Kampuchea
1982	Iraq	Iran	Tigris Marshes

Source: Mustard Gas: The Science of H. NBC Defense and Technology International. September 1986. p. 70.

Enemy use of chemical weapons at sea avoids most of the pitfalls and disadvantages of employment on land. There are no cities, populations or agriculture to contaminate, and there is no residual contamination except on the target vessel. Using CW agents at sea or on the beach may be an acceptable option for an enemy facing a forced entry amphibious assault. A final advantage is that seaborne forces represent a purely military target, which may temper any world opinion on the use of these horrible weapons.

A Measured Response

An operational commander who has been authorized the release of chemical weapons in retaliation for attacks at sea

might find himself in a dilemma. In the absence of an enemy naval target, he may be hard pressed to use retaliation in kind against a land target which may risk extensive collateral damage and civilian casualties. A conventional or nuclear attack against the enemy's means of chemical production may be the answer, but it may not stop enemy chemical attacks entirely. In fact, the enemy might argue that his selected attack on our naval forces was a purely military target, while our land attack may produce collateral damage beyond the military objective, and produce unacceptable political or moral dilemmas. Our only recourse may be to "weather" chemical attacks at sea and plan a "measured response" on unrelated targets.

Coalition Warfare

Another operational consideration is the CE defense readiness of our current and future allies. The success of Desert Shield/Storm depended in part on our ability to employ coalition forces to defeat Iraq. Without allied assistance and the use of bases and ports, it would have been difficult to project ground forces into the region, our recourse being a costly amphibious assault.

When considering joint and combined coalition maritime operations, planners must consider how well or how poorly trained and equipped our allies may be. In a 1986 assessment of capabilities: "...only one ship in the U.S. Navy has NBC

collective protection, while essentially all major combatants in NATO navies are equipped with NBC collective protection based on variations of the citadel concept."7 Since this assessment was published, the U.S. Navy has made some improvements in protection, but many potential allies may or may not be able to function fully in CB environments.

This may be a key factor in a joint commanders approach to his mission. For instance, operating in regional contingencies with coalition task forces, we may rely heavily on allied ability to accomplish typical "brown water" tasks such as mine clearing operations. If our allies are not equipped to accomplish their tasks in a chemical environment, sea control might become a significant challenge.

The importance our NATO allies have placed on shipboard CB defense should not be lost on us. Joint and combined operational commanders should be aware of allied enhancements and factor them into their operations. In some cases, allied abilities may exceed ours. The opposite is also true. If allies are to play a role in combined operations involving chemical warfare, they must be protected to the same degree that we are, or their vulnerability protected. Operational task forces which cannot integrate the capabilities of all units have an Achilles heel. Inversely, fully integrated abilities allow us to work in concert with our allies, providing deterrents which might discourage potential enemies from relying too heavily on chemical weapons.

CHAPTER IV

PRESCRIPTIONS FOR IMMUNITY

Treating the Symptoms

In response to the realities of a changing world, the services have incorporated chemical warfare defensive training into most operations. The Navy and Marine Corps have addressed some of the equipment issues connected with CB warfare at sea, and the CNO has asked the Joint Contact Point and Test (Project DC 49)¹ at Dugway Proving Ground Utah to study the effects of chemical warfare on Navy and Marine units and operations. A range of studies have been conducted from surface warfare tasks to amphibious operations to determine the effects of chemical weapons at sea.

In exercise KERNAL ELITE 86 and SOLID SHIELD 87, Navy and Marine Corps units tested a variety of amphibious task force (ATF) and landing force commander (CLF) tasks including casualty handling, wet well, aircraft handling, beachmaster, cargo handling, and causeway operations in a CB defensive posture. Studies have also been conducted on the effects of conventional munitions mixed with chemicals on U.S. Navy FFGs (frigates).² Parameters for the tests are developed at the Navy's Surface Warfare Center at Dahlgren, Virginia, the Army's Test and Evaluation Command and Ballistics Research Laboratory, and associated contractors.

The Training Cure

The tests have shown equipment modifications to be important, but the key ingredient in CB survival is training and adaptation by all hands. However... "The Navy's later recognition (in the early 1980s) of the need to be able to survive and operate in a chemically contaminated environment appears to have reflected a long held belief that deep water fleets were not suitable targets for chemical weapons. Individual and collective CWD [Chemical Warfare Defensive] training is conducted without a notable degree of emphasis."³

The Navy has instituted a variety of programs to correct this problem. At entry level, junior officers receive .3% of their education in CBR defense. Enlisted recruits receive 3.3% of their training in CBR defense at Hull Technician "A" School. The total time devoted to CBR defense at Damage Control school is 10% of the class requirement.⁴ In the operational commander's arena, all hands are required to attend CBR refresher training, and required to don protective equipment at least once each quarter. During "Selected Exercises" (SELEXs) ships crews conduct graded Chemical and Nuclear contamination drills to test self defense procedures. SELEX tasks are required for sailors to receive a basic damage control qualification. Additionally, CBR tasks are included in Refresher Training (REFTRA) during each 18-24 month work up period. The REFTRA is conducted for 3-8 weeks depending on how proficient the crew is.

Training Limits

Although the training programs and exercises are generally an honest attempt to satisfy CB training requirements, training quality varies widely. Some operational level commanders find chemical drills are labor intensive, time consuming and low priority because chemical attack seems a remote possibility (the blue water syndrome). Crew morale is also a concern, as chemical drills put sailors into uncomfortable equipment, slows transit, stops productive work, or interrupts mess deck operations.

The accessibility to training equipment aboard ship is restricted by stowage constraints. Unlike the Army or Marines who issue individual training gear, some sailors may only see the protective equipment during attendance at practical demonstrations rather than actually wearing the equipment while conducting warfighting drills. Carrier battle groups (CBGs) or amphibious task forces (ATFs) rarely conduct collective exercises in CB defense, the costs and delays in steaming time being prohibitive. Some training can be accomplished during independent steaming, as long as the ship's captain emphasizes the importance of CB defense.

The maritime operational commander must weigh these disadvantages against the threat, his steaming schedule, and mission objectives. In future contingencies, naval commanders may need to take a closer look at CB training before committing "blue water" forces to "brown water" operations.

Available Guidance

Joint Publication 3-11 --Joint Chemical Operations. provides us with CB warfare guidance within the continuum of the states of peace, conflict and war: Conducting CB defense training exercises to demonstrate our survivability and combat effectiveness; In peace keeping and humanitarian assistance in the wake of limited use of CB agents by terrorists or belligerents; or during regional conflicts and general war.⁵

Joint force commanders need to be aware of the preparedness posture of their forces in all facets of CW defense. Joint commands should ensure that force components are fully capable of conducting integrated chemical defense operations with one another... Mobile forces for purposes of this publication include all maneuver elements on land, air, and sea. The principles of CW defense are: avoidance, protection, and decontamination.⁶

The importance of joint maritime operations to our Military strategy cannot be overemphasized. Naval operations will play key roles in power projection as they always have in the past. Chemical and biological defense is just another aspect of the projection of power and must be considered by operational commanders when weighing the effects of enemy capabilities on his forces. If there is a possibility the enemy can employ CB warfare, the operational commander must plan accordingly to allow his joint maritime operations maximum flexibility with minimum impact.

CHAPTER V

CONCLUSIONS

Joint Maritime operations are not yet immune from the threat of chemical warfare. The unique characteristics of the environment, combined with the additional threat of chemical or biological warfare in regional contingencies adds another dimension to joint maritime operations. Our critical maritime role requires us to demonstrate new flexibility and higher levels of readiness to respond to the challenges of an unstable world.

Joint maritime operational forces have an increasingly "brown water" mission. Having the time to train and equip ourselves to meet the challenge is a luxury we can no longer afford, nor can we expect the Army or Marines to solve unique maritime problems. One clear solution is to increase our awareness of how chemical and biological warfare at sea may influence our operations, and take the necessary actions to plan an effective defense or response. To some, this may seem a bitter pill to swallow, but a prescription for immunity is only effective if the patient is willing to take the treatment.

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